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ABSTRACT

This document's three-fold purpose is to give guidance to schools that will be using technical assistance, to raise important considerations for those resource units that provide such assistance, and to point out areas of concern to Pennsylvania Department of Education planners. Included are four articles by University of Pittsburgh faculty members on the role of technical assistance in facilitating the use of various kinds of knowledge in the school improvement planning process. Evelyn Fisher's "Long Range Planning for School Improvement: Technical Assistance" outlines the function of technical assistance in relation to knowledge use facilitation and provides a conceptual framework for the remaining articles. Jean Winsand's "Knowledge Use, Decision Types and Stakeholders: Implications for School Improvement" examines the Planning Guidelines for School Improvement with reference to knowledge utilization theory and discusses the process of technical assistance. Charles Gorman's "A Perspective on the Future of School Improvement in Pennsylvania" examines School Improvement Plan assumptions relative to technical assistance and speculates on the future of such assistance in school improvement. Finally, Burkart Holzner and Evelyn Fisher's "Knowledge in Use: Considerations in Sociology of Knowledge Application" offers more in-depth information concerning knowledge use literature. (JBM)

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KNOWLEDGE USE AND SCHOOL IMPROVEMENT

Implications for the Long-Range Plan for School Improvement of the Pennsylvania Department of Education

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INTRODUCTION

An important aspect of the Pennsylvania Long-Range Plan for School Improvement is the partnership concept of technical assistance. This requirement is included in the plan to initiate a process whereby basic education units can access higher education units, intermediate units, state and other resource units as they proceed through the school improvement process.

In contrast to other areas of the plan, which are completely outlined and defined, the partnership concept has been left open to interpretation by all units involved.

This document has been developed to:

1. Provide guidance for those units which will be using technical assistance,
2. Raise considerations for those units which are providing technical assistance, and
3. Point out areas of concern to the PDE planners.

The University team, in working with the problems and concerns of technical assistance, has used Knowledge Use as its conceptual framework. It is our belief that the basic goal of technical assistance is facilitation of the use of various kinds of knowledge in the school improvement planning process. Therefore, we have leaned heavily on the Knowledge Use literature in preparing this document.

The document is organized to provide a "guided tour" of Knowledge Use and School Improvement.

The first article written by Dr. Evelyn Fisher of the University Center for Knowledge Use, School of Sociology, provides an outline of the role and function of technical assistance as it relates to the facilitation of knowledge use. This article provides a structure for the total document.

The second article by Dr. Jean Winsand from the School of Education, is an examination of the Planning Guidelines for School Improvement utilizing a Knowledge Use frame of reference. The process of technical assistance is discussed.

The third article by Dr. Charles Gorman from the School of Education, is an examination of the assumptions contained in the School Improvement Plan relative to technical assistance. This article makes some predictions concerning the future of School Improvement technical assistance.

The final article by Drs. Burkart Holzner and Evelyn Fisher provides an intensive discussion of the Knowledge Use concept and is included to provide more in-depth information of the Knowledge Use literature.

LONG-RANGE PLANNING FOR SCHOOL IMPROVEMENT: TECHNICAL ASSISTANCE

Evelyn Fisher

University of Pittsburgh

Long-Range Planning: A Knowledge Use Perspective

School personnel are at the "cutting edge of action," often kept fully occupied in the process of using their professional skills and experience in the day-to-day activities or solving immediate problems. It is not surprising, as a consequence, that some practitioners question how to engage in long-term planning for improvement when they are pressed merely to maintain the system as it is. Planning can be directed, however, not only to improving effectiveness of schooling for the students but increasing efficiency, to formulating and solving problems in order to improve the functioning of schooling for all involved. Planning can increase the use of knowledge for handling or alleviating complex problems, even for avoiding them, and for selecting means to meet objectives and to the more diffuse goals toward which those objectives are directed.

It provides a referent for organizing efforts and measuring accomplishments so that all participants can gain a clearer picture of what they are accomplishing as a collectivity and where they want to direct their efforts. Technical assistance is available to help school personnel undertake long-term planning.

The Use of Technical Assistance

The Pennsylvania Department of Education (PDE) guidelines recommend that schools avail themselves of the technical assistance from the PDE, the Intermediate Units and the Institutes of Higher Education. Even though school districts themselves are expected to conduct their own long-range planning so

that it will be appropriate to the expectations and needs of their own community and situation, technical assistants from outside the district can broaden the resources and expertise existing within the district. Not only are these assistants able to access ideas, innovations, technical and problem solving skills that have been developed or tried elsewhere, but they can provide their own knowledge, skills and experience in working collaboratively with school district personnel, in the processes of long-term planning itself. Long-term planning involves continuous processes of needs assessing, action planning, implementation and evaluation rather than a one time set of sequences. School personnel by virtue of their location and primary responsibilities within a system have less opportunity or functional need to master the state of the art with respect to planning procedures. Outside technical assistants can through their experience in multiple school districts and the allocation of their time and responsibility to the processes and procedures of long-range planning share with the school districts the cumulative learning in this specialized field.

Ways of Using Technical Assistance in the Past

A number of different approaches for making use of technical assistance have been tried in the past, not all of which have created improvement that can be measured or sustained. These attempts have become opportunities for learning how to collaboratively help practitioners achieve their intentions. They are worth reviewing briefly in order to put newer approaches in perspective and to recognize the limitations of some that have been tried.

A. Turning the Responsibility Over to Outside Assistants. Some early attempts at school improvement made use of outside expertise by allowing technical assistants to enter the system, plan, assess and introduce change. It was thought that these persons could introduce effective practices, both administrative and instructional, which the practitioners in the system would then

adopt and maintain on their own. The processes or criteria that the technical assistants employed in decision-making were not always explicated. Experience has shown that these attempts often became dependent on the presence of the outside assistants and were not sustained when they left the district. Outside experts used their knowledge, professional skills to take on internal roles rather than to help school personnel do it themselves.

B. Technical Assistants as Change Agents or Linking Agents. This has been a prevalent approach for assisting schools to implement innovations that have been developed elsewhere which the school has decided to adopt. This use of technical assistants can be effective, provided that the school district has determined what innovation it wants to use. The problem is identifying what innovation is desirable because it is not a simple sequential and mechanical process of determining a need and finding an innovation to meet that need. Many innovations require a number of changes such as materials, instructional strategies, management systems and even role changes. It is often difficult to adopt less than a total integrated innovation because parts taken out of context are not likely to be readily adaptable to current practices. It is also difficult to determine what effect such a part would have. An example from relatively recent experience in education has been the diffusion of the idea that instruction should be individualized since students enter any classroom with different prerequisite skills and vary in their rate of learning. The concept of individualization may be adopted by a district or a teacher but to actually introduce the concept in action requires materials, data eliciting procedures and management techniques. While undoubtedly many teachers have individualized instruction to some extent, to do so for an entire classroom of students requires instructional program materials that were designed for or lend themselves to individualization rather than those primarily designed for teacher-led classroom instruction. When schools have a

need to replace curricular programs and do select from available possibilities that they believe will meet this need, technical assistance can be helpful in familiarizing school personnel with the program. This approach to planning and the use of technical assistance is restricted to specific changes within an existing system rather than changes in the system itself.

C. Technical Assistance in Problem-solving. This approach may be useful when the school district has a clearly agreed upon problem and can articulate it for outside technical assistants. In general, when a problem is not a crisis, identifying or formulating problems involves knowledge transactions. Even when there is apparent consensus on problem identification, it must often be transformed in order to consider what solutions might possibly be tried. Very few "problems" are of such simplicity that only one change is needed to resolve them. Most problems in the educational field are not only complex but ill-structured problems. By "ill-structured" problems, we mean problems that cannot be stated in simple cause-effect relationships or broken down into a set of such relationships. In undertaking long-term planning, problem formulation itself involves using knowledge to decide on where improvements could be made and what means could most effectively serve those objectives. School personnel may find that technical assistance is required at the problem formulating stage rather than after the problem or need has been articulated. "Needs" themselves are contingent upon what is known that is available, and are constrained to variables that the schools can actually manipulate. Needs are influenced by socio-cultural transactions. They are not obvious in the absence of solutions to satisfy them.

Conceptualizing Technical Assistance for Knowledge Use in Long-Term Planning:

Long-term planning for school improvement is a change "of the system" which involves instituting needs assessing, action planning, implementation and evaluation to be undertaken systematically at an explicit level. Whereas these activities

have been undertaken regularly in school districts, they have often been done at an informal and intuitive level and with more influence from respected authorities or suppliers of educational materials than from the needs of the district itself.

All of the stages of long-term planning have become the specialized domain of extensive research and technical development. It is both improbable and impractical for school practitioners to master the cumulative growth in these areas and to become experts in all of these processes. The consequence is that guidelines are written in specific steps that school personnel may follow with the recommendation that technical assistance be sought where needed. The problem that school personnel may have is in defining when a situation calls for "technical" assistance. From the perspective of the technical assistant, the problem may be to provide assistance when presented with a problem formulation out of the context in which that problem formulation developed.

Various types of technical assistance may be needed in order for school districts to engage in effective long-term planning. If we consider the institutional sources of technical assistance that may be accessed and the particular type of expertise associated with these institutional settings, a clearer picture emerges for a practical division of labor.

The Institution of Higher Education particularly in research universities produce as well as transmit knowledge. It is reasonable to expect faculty members to read the research literature and remain abreast of a developing field. The technologically sophisticated and cumulative learning that this requires is meaningful for those responsible for educating future researchers as well as conducting research. For example, needs assessment as a developing area includes mission analysis, specification of mission objectives, performance criteria and measurement, functional analysis, task analysis and methods-means analysis. Operationalizing the concepts that have been generated and developing indicators requires a bridging

between the conceptual-methodological research and prescriptions for action. This bridging may be considered the transformation from conceptual models to functionally prescriptive models and the refinement of the functional steps into a range of alternative procedures.

Further technical assistance can be offered in collaborating with school personnel in using these functionally prescriptive models. At every step in the processes and stages of long-term planning for school improvement, there are various strategies possible for eliciting data or interrogating available data. The technical assistant who becomes a collaborator with the district personnel and stakeholder representatives can broaden the experiential knowledge and access to resources. By doing so, the technical assistant is not imposing a pre-established plan or authority on the district participants but rather is assisting in the consideration, transaction, and use of knowledge as the school district group engages in long-term planning. As a colleague in the knowledge transaction processes, the technical assistants can increase the access to resources and experience beyond the confines of the district itself. The process of problem formulation, for example, is not a mechanical procedure but involves beliefs, assumptions and interpretations. If the technical assistants participate as group members, they are aware of the context of problem formulation which provides them with more adequate information in considering possible resources they might access or suggest for problem resolution. They can assist not only with the discriminate analysis, that is, the difference between where you are and where you would like to be, but with the analysis of various resources so that acceptable and effective meshing of needs and resources to satisfy needs can be considered.

Without active collegial participation in the long-range planning, the technical assistants must attempt to deal with the problem formulations of others out of the context in which they were socially negotiated. This requires that the

technical assistance be undertaken with a deficit of information. That is unlikely to allow appropriate contributions. Alternatively technical assistants can be colleagues in the processes of knowledge transaction, assessment and use, thereby broadening the information provided and available for accessing external resources.

The following discussion of the participant role of technical assistants and the technical assistance they might offer follows the stages outlined in the PDE guidelines.

The Needs Assessment Stage

In order to assess needs, the school district planning group must use knowledge

1. About the goals or outcomes of schooling that are desired.
2. About goals attainment currently being achieved.
3. About district priorities among areas where improvements may be attempted.
4. About how these diffuse goals can be translated into specific and accessible outcomes.
5. About where in schooling activities changes could be made to attempt improvement.
6. About what ideas, strategies, techniques, innovative programs, etc., are possible resources available for use.
7. About how these could be accommodated in the existing activities.
8. About what costs and benefits would be involved.

All of these involve to some extent subjective judgments and therefore the process of arriving at consensus to which all stakeholder groups can be committed involves social transactions. There are objective data that can also be accessed although even these at some prior time involved subjective judgment. For example, data on achievement with respect to the 12 goals of education is available for use. This "objective" data rests on subjective judgments regarding what will be accepted

as indicators of achievement. Indeed the 12 goals themselves involved earlier surveys where subjective definitions were reflected in responses. The 12 goals themselves reflect what the collectivity in this case, the Commonwealth of Pennsylvania, values and believes to be important to life in the society. These goals are stated in diffuse terms which indicate general areas of behavior, attitude and competency that the people believe students should manifest or acquire during their schooling experiences. These goals may be considered "knowledge claims" that have been arrived at by the community. By that is meant that it is believed that the attainment of these goals by students will promote their own well being and that of the society itself.

These "knowledge claims" are attempts to describe observations of our socio-cultural environment that make sense of that environment and create order within the society. Individuals bring to any situation assumptions based on existent beliefs, values or experiences and interpretive structures. In a collective planning endeavor these knowledge claims are transacted in the process of constructing a shared social reality. These processes of putting forth "knowledge claims" and transacting knowledge continues at various stages and at various levels. At any point of intervention in an on-going system, as in undertaking long-term planning, the process makes use of and builds upon these knowledge transactions and decisions that have been made previously. So, for example, at this point in time in the Commonwealth of Pennsylvania, there are data that are available for use such as the E.Q.A. data and standardized achievement test data. These data do not "speak for themselves" but can be interpreted to provide "knowledge claims" about how well a district, a school, a classroom or an individual student is achieving according to criteria based on previous knowledge claims. When people are presented with "knowledge claims," they assess them in terms of their relevancy, adequacy, cogency and authenticity. Although we may not be consciously and reflec-

tively aware of these processes as we make decisions to use or not use knowledge claims, they nevertheless do occur. These assessments can be specified as: Is this knowledge relevant to some decision I want to make or act on, is it adequate for me to act on, is it cogent or convincing to me, and do I have confidence and trust in this knowledge and its source.

The discussions which ensue when a collectivity assesses needs or makes decisions based on knowledge claims reflects the various responses that people have to the assessment they have made of knowledge claims. They share these as the group explores them for collective decision-making. The technical assistants by their awareness of differences in the assessment and acceptance of knowledge claims among group members can facilitate the negotiations, range of claims and information considered and consensus formation. If controversies arise in the process, the technical assistant can help explicate differences in assumptional structures and perceptions. These may be contingent on the person or group's location in the social structure with respect to schools, their responsibilities and what they specifically attend to. Further discussion of the 8 steps of needs assessing can indicate where and how technical assistance may be offered.

1. The desired goals or outcomes of schooling have been determined on the basis of a statewide survey which resulted in the articulation of twelve goals of education. These are stated in general rather than specific terms. Although these reflect a prior process of consensus formation, the generality of the goals leaves room for interpretation at a more specific level. Technical assistance may be offered in understanding the processes that have gone before and how to proceed from this basis.

2. Various data are collected by the schools and submitted to the PDE where they are manipulated and returned to the district for their use. These data are standardized and allow comparisons to be made: comparisons between achievement

and desired states, comparisons across districts or comparisons within. Long-term planning groups may avail themselves of technical help in using these data such as EQA and standardized achievement test scores to assess where improvements may be desired.

3. Determining where improvements are to be made requires the combining of information on where improvements could be made as inferred from data and where agreement develops on priorities. These are still at the level of general goals and setting priorities may be an interactive process with the following steps.

4. The translation of diffuse or general goals into specific objectives is a task where technical assistants may be required. This is not a step that can be formally deduced and breadth of experience in what is available or been tried may be helpful.

5. Where in-school activities changes could be made is often less clear for goals that are not skill-specific. Discussion can raise consciousness and explore how objectives might arise in the course of teaching various subjects. Technical assistants can broaden the range of possibilities by contributing their own knowledge and experience to the discussion.

6. Even when priority decisions have been made and some agreement has been reached on where improvement efforts could be directed, there is a need to explore a variety of means to realize these efforts. In accessing available resources for consideration, it is necessary to analyze existing curricula or innovations to accomplish a match between instructional materials, strategies, etc., and objectives of the planning. This is a task which requires analytical skills and is a point at which technical assistance will probably be needed by most districts.

7. Accommodating any new knowledge or practice into existing practices may require some modification to create appropriate fits. Some changes may be added to

existing practices but most are likely to require some alteration in current practice, if not actual replacement. Discussion about the possible consequences can be helpful not only in decision-making but in terms of comprehension and commitment. Technical assistants can draw on experience to anticipate consequences to be considered.

8. Introducing changes involves some cost-benefit analysis or risk-calculations whether this is done tacitly or explicitly. Technical assistants can assist by accessing any data available and by helping the group to consider advantages and costs in terms of time allocation, effort or finances.

The needs assessment stage involves the interface of knowledge-in-use and current practices with expert and experiential knowledge. Technical assistants can increase the experiential knowledge and access expert knowledge where it is available and appropriate. The collective enterprise is one of knowledge transacting among persons with different frames of reference, assumptions, interpretive structures and assessments of knowledge claims put forth. When decisions have been made about where improvements are to be attempted and with what priorities, the technical assistants can contribute to action planning.

The Action Planning Stage

From a knowledge use perspective, the needs assessment stage and the action planning stage are interdependent and overlapping in terms of processes. That is, the process of assessing needs and setting priorities for where efforts are to be expended cannot be separated from the consideration of what possible options are available for acting to meet those needs.

The action planning is the specification of the decisions that have been made as the needs and possible resources have been assessed in interaction with each other by the participants with the technical assistance provided. The plans transform these into specific actions that are intended, detailing what resources will

be used and who will be involved and in what way.

There are multiple considerations at this stage. It is insufficient to merely assess what is the range of possible options for meeting a need but practical issues must be considered. If any change involves the acquisition of new materials, financial resources must be considered. If professional development is required who will be affected and how this is to be accomplished must be considered. What will any change affect and how, such as replacing existing practices, altering existing practices, adding to existing practices. Technical assistance may be able to broaden the experiences of the district so that the conditions, contingencies and consequences can be thought through.

Technical assistance may also be needed to determine how resources can be acquired, whether these are material or training. In developing action plans, questions often arise regarding the feasibility or the workability of various options considered. Technical assistants may be able to provide information on the use of these by other districts or at least to help district personnel systematically or systemically consider what will be involved.

Implementation Stage

When the action plans have been established, the implementation of the plans may involve:

1. Materials acquisition.
2. Skills acquisition.
3. Accommodation and integration of both new and existing practices. Depending on what changes are to be introduced, this may involve administrative tasks, scheduling, classroom management or instructional changes, etc.
4. Working out a more detailed operational plan for the timing and rate of change.
5. Contingency management that allows enough flexibility to implement plans even when unanticipated events or situations occur.

Technical assistance may be needed not only to acquire the resources the district will require but to provide the training necessary. Experience has revealed that creating changes is often a developmental process. Teachers in introducing change often do it in incremental stages rather than an immediate replacement. Preservice workshops by technical assistants are often insufficient. In service or recurring opportunities for interaction and consultation can help the teacher continue to progress toward the desired changes.

Evaluation Stage

Evaluation is often dichotomized into formative and summative, in which formative evaluation feeds back into the system to capitalize on desired consequences and alter plans that are having unanticipated effects that are not desired whereas summative evaluation compares the outcomes to prior outcomes that had been attained or with those obtained by comparable units. Processes as well as outcomes may be evaluated formatively.

Technical assistance in conducting evaluation may be offered on a collegial and concomitant basis as improvements are attempted. Practitioners who are involved in action cannot at the same time step back, observe and reflect. Technical assistants who undertake participant observation may be able to provide practitioners with information to help them realize their intentions more effectively or eliminate any unanticipated consequences that the practitioners do not intend. Technical assistants may serve as consultants or resource persons to whom practitioners may turn when they encounter problems or needs in implementing the planned changes.

This type of on-going evaluation undertaken concurrently with the implementation of action plans facilitates collaborative relationships and knowledge use. It can be directed toward improving outcomes in which the practitioners and technical assistants have a shared and vested interest.

KNOWLEDGE USE, DECISION TYPES AND STAKEHOLDERS:
IMPLICATIONS FOR SCHOOL IMPROVEMENT

Jean E. Winsand
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A review of the literature in knowledge use provides an interesting basis for consideration of the Long-Range School Improvement Plan. Considerable emphasis in this paper will be placed on the process of Technical Assistance.

For purposes of analysis, I have chosen to identify three major aspects of Knowledge Use and apply them as a filter through which to examine the LRPSI guidelines. The aspects include: 1) Types of knowledge; 2) Decision types; and, 3) Stakeholder frames of reference.

The types of knowledge identified for this paper are: data, research, evidence, experience, and common sense. In this instance, data is defined as test results, course outlines, program goals and prioritized goals. Research is defined as any information which has been examined and tested in actual or simulated situations similar to the one for which the research is being considered. Evidence is considered as actual validated on-site information which supports or refutes the change process in a particular situation. Test data is viewed as evidence for certain change recommendations, as are observations and, of course, on-site research findings. Experience is defined as a more general, non-validated type of information. An example would be a classroom teacher's knowledge of "what works" accumulated from her years of experience. For the purposes of this paper a fifth form of knowledge is identified as opinion which for our purposes includes the generalized and personalized opinion-type information which seems characteristic of the public's knowledges about the schools.

The four decision types which are examined in this document include:

1. definitive--denotes, connotes, classifies.
2. designative--describes, explains, predicts.
3. evaluative--evaluates.
4. advocative--recommends a particular course of action.

The Stakeholder role groups identified are: administrators, teachers, pupils, parents, community, PDE and technical assistance personnel. An attempt is made to identify some examples of stakeholder frames of reference in this discussion.

Each of the four steps of the LRPSI Overview will be examined separately relative to each of the items identified.

The LRPSI Overview of April 1981 defines the task of LRPSI in the following paragraph.

PLANNING GUIDELINES & REQUIREMENTS

> Each of the following "SECTIONS: includes a list of the documentation that is to be submitted to the PDE as evidence that the district and its buildings have engaged in Long-Range Planning for School Improvement. Each required documentation is labeled as an "ITEM." The written responses to the "ITEMS" will comprise the required portion of the district's Plan. Since this is the district's plan, additional information may be added if the district so desires.

It is important to recognize that the planning documents themselves constitute a form of information which, because of its formative aspects, I would classify as data of a definitive nature. This document clearly places the PDE in the role of a major stakeholder. The frames of reference of PDE as a stakeholder are complex and include aspects which are distinctly political. The School Improvement process is, by its association with Long-Range Planning, a mandated activity. The goal of the PDE has consistently been to support local incentive and initiative as much as possible. Therefore, PDE personnel find themselves in the difficult position of regulating a mandated process while,

at the same time, trying to encourage the process to be nearly totally local in its staffing, implementation, and evaluation.

On the other hand, school districts must make decisions which are not only political in a state-wide sense but are fraught with political implications locally. Compliance implies involvement of community groups in significant ways in the educational decision-making of the school district. Failure to comply opens the spector of some form of punishment down the line. This decision could conceivably have financial implications in terms of budget cuts for failure to comply (as has occurred in neighboring states) or educational implications if school certification is withheld. None of these are explicated threats, nor do they have to be, in order to insure compliance. Even the suspicion, in the minds of the local stakeholder groups, is adequate to assure at least a form of compliance.

On the positive side, the LRPSI provides for local school district stakeholders an impetus to change with a variety of built-in support systems; i.e. EQA data, PDE resource systems, technical assistance partnerships and some funding support. An aggressive, creative team of stakeholder's within a system can use the political impetus of the LRPSI to effect a climate of change for desired educational modifications.

The technical assistance role function is of great interest because it is not mandated, yet it is strongly recommended. In fact, the PDE technical assistance personnel are automatically assigned to the local districts. The technical assistance function is essentially one of facilitating the use of knowledge of various types; that which is already available in the district, that which is not available but is introduced by the technical assistant and that which is actually general opinion as opposed to what is perceived as "hard" data.

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personnel as stakeholders in the process.

I. Preparation of District Administrative Plan for LRPSI

Step 1 of the LRPSI Overview issued in April 1981 requires the preparation of a district administrative plan for LRPSI. The knowledge requirements for this plan include outcomes expected and a general management outline for the total local LRPSI process. The knowledge type required here seems to be experience since no reference is made to actual knowledge collection. It may, in fact, be that most first step management planning is based on experience with more in-depth types of knowledge being implied in later steps. A question should be raised of LRPSI districts at this point concerning the process in this type of administrative planning. The decision type most evident in this Step of the process appears to be designative in that outcomes are established, work identified, time schedules and communication patterns set, resource needs established and personnel involvement processes suggested. All of these activities are basically designative but I would suggest that, at this point, there is a distinct possibility that the decision process could become advocative which would create a major change in the ensuing processes.

Since the major stakeholders in the Step will tend to be administrators, the frames of reference with which they will enter the process must be considered. In most school systems, the administrator at both building and district levels, is highly aware of the fact that "the buck stops here." Any realistic appraisal of a process for change must take into account the survival needs of the persons in charge of the current situation. An administrator must deal with the personal responsibility for the current status of a building or system which is being challenged to improve. Asking administrators to outline the improvement plan therefore fails to recognize their role to defend the status quo. Another interesting complication of Step 1 is the very strong emphasis placed upon involvement of the community. The need to involve in meaningful ways another

unit of stakeholders creates an interesting paradox. Of all stakeholder groups, the community composed of parents, non-parents, political groups, religious groups and special interest groups, is the most complex and politically "loaded" of all stakeholder groups. Yet, this same group is, in essence, mandated into the LRPSI process. This group is designated by the state to receive information, provide input and support school board and district staffs from the beginning. The very choice of administration and community groups as the critical personnel involved in LRPSI at this initial step sets in motion a fascinating set of problems in Knowledge Use.

1. How can administrators develop planning processes which are not defensive of current policies and procedures?

2. How can administrative plans provide for the flexibility necessary to provide commitment of all internal stakeholder groups, i.e. teachers, pupils, support personnel.

3. How is the community stakeholder group brought into a meaningful involvement in LRPSI? How are the many sub-groups to be recognized and incorporated into the process?

4. How is the influence of community stakeholders to be balanced off against the professional stakeholders' expertise and professional and personal interests?

5. What knowledges are to be shared, utilized, protected? What groups will have access to what knowledges and at what levels?

It is evident that Step 1 instead of representing a general management plan development is a highly complex step requiring sophisticated planning for what may be major changes in terms of the decision-making structures of the school district.

One other concern needs to be noted at this Step. Little reference is made to staff involvement. In this time of professional associations and negotiations, this is a critical point. The exclusion of staff in the planning process could doom the effort at once; especially in view of the community involvement. On the other hand, one is intrigued by the possibility of administrator-community

collusion in processes to force changes in classrooms.

A third issue in Step 1 concerns the partnership concept of technical assistance. If technical assistance is to be required, the point in time at which this assistance is brought into the process is a very critical issue The problems of an agent of technical assistance are complex in the LRPSI process. Examination of the total LRPSI Overview and Guidelines suggests that technical assistance may be sought at a variety of points on the continuum. The first reference to this process is made in Step 1 of the Overview where reference is made to partnership agencies in planning and organizing for technical assistance. Steps 2a and b refer to the need to determine necessary resources for improvement, and Step 3 refers to analysis of implications of proposed actions for non-district support needs and obtaining support required to facilitate proposed actions. During determinations relative to Step 1, the stance of the district concerning the technical assistance role needs to be decided. Technical assistance is obviously available in a wide variety of modes. It must be assumed, however, that different agents of technical assistance are prepared to respond in different ways. Some may be very reluctant or unprepared to respond during needs assessment or management planning stages. Other agents may view this involvement from the beginning as critical to their participation. Certainly all agents will require opportunity to act in the decision-making process which defines their partnership role.

II. Analysis Programs and Services; Management Area: Strengths and Needs

Steps 2a and b of the Overview of LRPSI initiate the assessment phase of the LRPSI process. At this point, it is assumed that all staff of the district and the community representatives are involved in the process significantly. The involvement of technical assistance agents is not clearly identified but is implied.

The knowledge types at this stage tend to fall largely into the category of data, including program goals, course descriptions, student assessment information

and prioritized goals of EQA. Note: It is helpful at this point to examine the LRPSI Guidelines and Instructions document--Section 1, Educational Programs/Services for extensive definition of required information during this needs assessment stage. It is possible that some of the information required can be categorized as evidence. At Step 2 it is critical to note that information will enter the process which has to be categorized as opinion. This is the generalized and personalized knowledge of the various community groups. Planning in Steps 1 and 2 must recognize and consider ways of incorporating and dealing with this type of information. Certainly, as action planning (Step 3) is entered into, information which is seen as data in Step 2 can be utilized as evidence in Step 3. The decision types in Step 2 are basically designative as program goals are determined, curriculum is examined for its adherence to goals, test data is checked to verify student growth (an example of information being used as evidence), priorities are set and resource needs identified.

It is possible and perhaps probable that an advocative posture will emerge in Step 2. This would seem to be a misuse of knowledge at this stage. Districts should work to prevent a too early decision to go in certain directions. This will be a difficult process to manage as most of our planning experiences have trained us to make quick, rather precursory decisions to act. The LRPSI process clearly sets up guidelines for a longer, more deliberative planning process than is normally our practice. Step 2 is a structuring process including the gathering of as much data and evidence as possible and deliberations concerning broad, general goals which involve as wide a range of stakeholders as possible. It is critical to the process that districts grasp and take the fullest advantage possible of the opportunities implicit in this step.

Step 2 also is critical in that the process which initiates the interaction of the fullest number of stakeholders occurs here. It is reasonable to assume that

nearly all stakeholders who have any potential involvement in a local LRPSI process will be identified and involved by the conclusion of Step 2. It is probably impossible to completely identify all the frames of reference of this army of stakeholders. Suffice it to point out a few considerations.

1. Community groups--the frames of reference of the community must be expected to be varied and probably firmly held. As stated earlier, the knowledge of these stakeholders will vary from data, evidence and experience to opinion. Generally, it can be assumed that a large part of it will be opinion. A problem of the district will be to provide other forms of knowledge to the community in ways which facilitate change in frames of reference. This process must be planned for.

2. Teachers--An immediate recognition must be taken of the collective body of teachers in terms of the teacher organization. It is obvious that the frame of reference of the teacher organization will reflect national and state political orientations as well as local. These political stands are crucial and impossible to ignore in planning. They will influence considerations involving time frames, personnel utilization and classroom interventions.

It would be unwise, however, to fail to recognize the importance of the individual teacher apart from the organization. Aside from decisions which are part of negotiated packages, the individual teachers represent a variety of other frames of reference in much the same way that community groups do. This variety can represent a major source of strength and support for school improvement plans since many teachers welcome the opportunity for reasonable, supported change in the classroom. It is necessary to remember, though, that the community represents to teachers the same concern that it does to administrators. In addition, the parents of children and the administration represent sources of pressure that are more urgent for teachers than for administrators.

The technical assistance role is referred to often in ways which suggest that technical assistants do not possess frames of reference. This is a naive and troublesome assumption. In ways which are highly political, technical assistants are very vulnerable as they engage in LRPSI. First of all, there is the question of participation in very political processes in environments in which the technical assistant is essentially an outsider. Secondly, the technical assistant's support systems are based in an agency external to the LRPSI school district. In the case of IHE's, the supporting agent often is either indifferent to or openly negative toward the role of technical assistance. Therefore, technical assistance role participants find themselves in extremely high-risk positions. This risk increases proportionally to the degree of involvement in the external system and to the amount of change identified in the system which is attributed to technical assistance agents. Another hazard of technical assistance is ethical in nature. Just who are the stakeholders to whom the technical assistance agent is responsible? Treading the fine line between responsibility to stakeholders who are school system internal, i.e. teachers, administrators and school system external, i.e. community, parents, PDE is indeed a highly difficult and treacherous task.

Obviously, the baseline frame of reference for a technical assistance agent is personal survival. This becomes a tremendously complex undertaking in the process of partnershipping in the LRPSI.

Questions relative to Knowledge Use in Step 2 include:

1. How can data type knowledge be communicated to and collected from the large number of stakeholder groups in ways which insure its most productive uses in Step 3 (action planning)?

2. How can opinion-type knowledge from various stakeholders be incorporated into the collection processes?

3. What ways are best for sharing data and evidence information with stakeholders to create an informed group of decision-makers in LRPSI processes?

4. How can the interests of educator stakeholders be protected from attacks on the part of other stakeholders which tend to create defensive atmospheres and postures?

5. How can the decisions of Step 2 be kept designative and avoid becoming advocative before all the data is in?

6. It is important to bring attention once more to the technical assistance role. How does this role participant become involved in this step of needs assessment and data collection and analysis? What are the implications of the stakeholder frames of reference of the technical assistant? How can a LRPSI district recognize and facilitate greatest use of the technical assistance role without destroying the technical assistance agent or the partnership in the difficult process of stakeholder juggling?

III. Development of Action Plans

Step 3 of the LRPSI Overview represents the most critical knowledge use area in terms of planning. It is at this Step that Action Plans are developed.

The analysis of the data and evidence collected in Step 2 become the basis for development of action plans for change. Knowledge types expand to include research and experience as bases for decision-making. Hopefully, by this stage, opinion as a basis for decisions has become less evident in favor of a more evidence and experience-based process. The PDE plan calls for search for relevant practices and knowledge which can be examined relative to its appropriateness, practicality and feasibility for use in the action plans of the district. This encourages districts to begin making use of research type knowledge. Decision types at this stage now tend to be advocative. In addition, planning processes include decision-making for the evaluative processes which will take place during implementation of plans.

A unique twist appears in decision-making for knowledge use at this stage. It is here that another kind of knowledge use process occurs. In the process of examining the various practices and relevant knowledges, decisions are made as to the ultimate use of knowledge gathered. Practices examined may be adopted in total, adapted to local situations, discarded completely, synthesized into something new,

or portions may be selected out for use. It is important that planners recognize that this range of options is available at the action planning stage. It should also be recognized that any newly accepted practices or knowledges will not necessarily survive the implementation process as they are envisioned in the planning stages. Plans for evaluation must reflect ways of determining misuses, creative adaptations, and abuses of knowledge as well as impact and positive uses.

The stakeholders involved in this step should include all persons and groups involved in the School Improvement process. The requirement for searches for developed practices and relevant knowledges suggests that to many local districts this might be the point to reach for technical assistance. Although this is not an inappropriate utilization of the technical assistance role, it is a limiting one.

Questions of the appropriate Technical Assistance agent could be raised here. Should searches for relevant knowledges be addressed only to IHE's? In the current time of knowledge explosion, this is not an easy question to answer. The PDE has established, in a major statewide effort, a computerized information service which is fully equipped to seek out information, persons and services to supply school districts with formidable amounts of information. Intermediate Units have moved far beyond an inservice/service role. Several IU's carry on extensive action research projects on grants from federal and state sources. IHE's divide services between training, servicing and research and few IHE faculties are currently involved only in research. In fact, it is not uncommon to find federally funded research units functioning side by side with University Schools of Education. Private consulting and research firms such as Research for Better Schools are producing research and are well equipped to market this research efficiently.

Obviously, school districts will experience no shortage of potential partnership agents. The questions will deal with choosing the most appropriate agents.

Another point should be made concerning internally available resources. With most teachers and staff currently possessing Master's degrees and many doctorates in both teaching and administrative positions, many valuable resources can be found within the system.

If the LRPSI develops as envisioned, it is possible that a variety of technical assistance may be appropriate. More than one agent may need to be consulted. Planning for this must be carefully thought out in terms of costs and interagency interactions.

The frames of reference of the various technical assistance providers can possibly conflict, causing school districts some confusion and disrupting otherwise smooth processes. This must be planned for.

Another concern may be more appropriately raised to the technical assistance agents but school districts need to be aware also. It is suggested by the LRPSI plan that technical assistance be a partnership from the start of the project. This means that the external agent will be involved in needs assessment, analysis of critical data and the basic decision-making of the district. A curious problem arises for the technical assistance stakeholder in this process, for, in reality, the agent is responsible to all stakeholders in the school district. So, as data is shared and analyzed, the advisory process may lead to decisions which are not satisfactory or comfortable to certain stakeholders within the system. The need to fulfill responsibilities and yet maintain an ethical stance can conceivably place the technical assistant in a very difficult and probably no-win situation. This is an aspect of the technical assistance partnership that has not been considered. In the best of all worlds, a climate of open-ness and sharing will exist at all levels of the LRPSI process. In reality, every stakeholder has turf to protect and axes to grind. The external agent must thread through all these facets and come up with honest, often unpopular guidance. All technical assistants must

recognize the very real nature of this conflict.

In this paper, I have attempted a brief analysis of the first three steps of the LRPSI plan. I have indicated the types of knowledge collected at each step; the types of decisions called for and a few suggestions regarding the various stakeholders who may emerge with specific frames of reference at each step. More attention has been addressed to the technical assistance stakeholder than to others.

The LRPSI Plan is an ambitious and challenging statewide plan. It has the potential to create some very exciting changes in districts across the state. The implications of this type of plan are extensive. It is wise to recognize the political, personal, financial possibilities and plan from a very realistic base. The Knowledge Use concept with its recognition of the stakeholder frame of references relative to knowledges can provide a realistic basis for planning.

A PERSPECTIVE ON THE FUTURE OF SCHOOL IMPROVEMENT IN PENNSYLVANIA

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Introduction

The Pennsylvania School Improvement Plan represents an attempt by a state education agency to structure selected planning and implementation processes which will produce an emphasis on educational outcomes across the Commonwealth. As this state-wide process enters the second year, detailed information in the form of overviews and guidelines has been disseminated to clarify the structure, definitions and procedures which provide the mechanisms for this five-year program. While these documents promulgate the intended operating procedures, the information is also knowledge which enables concerned participants to explore both the assumptions which support the procedures and the possible future of school improvement.

This analysis is intended to serve the purpose of both clarifying and elaborating on the functions of technical assistance in school improvement. By so doing, the state-level specifications regarding resource utilization and specific institutional linkages for technical assistance can be refined. It will be assumed in this document that among the issues which surround technical assistance, none is more controversial than the knowledge utilization processes in school improvement.

Current plans for school improvement in Pennsylvania include five process phases distributed over a five-year period. These plans also refer to a recycling process which begins at the conclusion of the fifth year. A plan of milestones and a timeline of activity also has been proposed. Assistance is defined in terms

of functions each school district may expect to be fulfilled by the state education agency, intermediate units and institutions of higher education. In summary, three perspectives of school improvement have been developed by the state education agency as follows:

> The School District--To the school district and its schools, school improvement is a commitment to increase student growth on Pennsylvania's Twelve Goals of Quality Education through a systematic, ongoing process. In the process of school improvement, the district and its schools (1) periodically assess district and building needs, (2) develop action plans to address identified needs, (3) implement action plans, and (4) evaluate the results of the implementation effort.
>
> The Department of Education--At the Department of Education, school improvement is the structure around which the department has organized its leadership and service roles to insure that all children in the Commonwealth are provided with a quality education.
>
> The Support Agencies--From the perspective of intermediate units and higher education institutions, school improvement is a partnership mechanism through which technical and process assistance needed by school districts to carry out locally designed improvement efforts is coordinated and delivered.[1]

The various support agencies have been defined to perform functions which will facilitate local problem solving as explicated through the five phases of long-range planning for school improvement. However, this particular definition will be examined for the purpose of forecasting the extent to which the role of technical assistance as defined for school improvement can be fulfilled adequately. At issue, in part, is the intent of the state education agency to limit technical assistance to the support functions. While this approach may appear to be practical, it does limit the utilization of external agents and subsequently may restrict open inquiry

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[1]Long Range Planning for School Improvement, LRPSI Overview. Pennsylvania Department of Education, 1981

in the school improvement process. Viewed in another perspective, the proposed partnership of school districts, the Department of Education and support agencies appears to relegate the support agencies to roles which do not account for the expertise which is available in these agencies for school improvement.

In order to explore the proposed support agency role, the planning model for school improvement will be analyzed so that assumptions can be explicated regarding the future of school improvement. These assumptions then may be utilized to forecast some of the probable futures of school improvement.

The Planning Model for School Improvement

Clearly delineated procedures have been prepared by the state education agency so that each school district can be expected to engage in the processes of school improvement. These procedures are of the type which allow for variations of district-level implementation plans while specifying selected products for submission and review by the state agency. The model clearly promotes internal planning, implementation and evaluation through concensus and collaboration. Local problem solving is a prevailing theme throughout the process components.

Yet, with these general features, such a planning model should be scrutinized to estimate the extent to which each of its components contribute the general intent regarding school improvement and to forecast the impact of component linkage. For example, to what extent does the initial step of preparation influence the second process of needs assessment? Is it premature to organize administrative processes before the needs assessment is conceptualized? Can action planning in step three which includes multiple stakeholder groups be implemented in step four by a professional staff who has shared this planning process with community advisory groups for the first time? The five-step planning model[2] is summarized as follows:

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[1]The Planning model summarized herein is described in detail in the Pennsylvania Department of Education document titled LRPSI Overview, April, 1981.

Step One

Prepare and Implement a District Administrative Plan for LRPSI

The District Administrative Plan addresses overall accountabilities, timelines and resources for implementing the steps in LRPSI. It should be a working document, subject to revision and amendment as the planning process unfolds.

Step Two (a)

Analyze Building/District Programs and Services? Strengths and Needs

This step initiates the assessment phase of the LRPSI process. School districts are expected to analyze their status with respect to programs and services on a building-by-building basis, and district-wide where appropriate. This analysis should result in a clear picture of student performance with respect to educational goals. Areas in which student growth should be maintained or increased should be given priority rankings for action planning to help in allocating resources among buildings and district-wide needs.

Step Two (b)

Analyze District Management Area: Strengths and Needs

This step continues the assessment process. School districts are expected to analyze their status with respect to management goals, primarily on a district-level basis. Information can be collected and analyzed with regard to such management areas as teacher recruitment, personnel education, changing enrollment, strike contingency plans, school business practices, board training programs, district testing program, and district discipline policy. This analysis should result in the identification of specific district management strengths and needs. Areas in which district management practices should be improved should be given priority rankings for action-planning to help the allocating resources.

Step Three

Develop Action Plans for Each Program and Services and District-Management Priority

Each school program and services need (priority goal) and each district management need, should generate a plan of action which describes:

- What change is expected in either student growth or management conditions.
- What activities will be undertaken to accomplish change.
- How those activities will be organized.
- How it will be determined what effect the activities had.

Step Four

Implement Building and District Action Plans

In implementation, the changes that are outlined in the action plans are launched, monitored and modified where needed.

Step Five

Evaluate Improvement Activities: Report and Recycle

This final LRPSI step involves the gathering, analyzing and reporting of information to help district and school staff (1) verify the implementation of building/district action plans and (2) assess the preliminary effectiveness of the improvement efforts.

Model Assumptions

To date, the Pennsylvania Department of Education has prepared several documents to explain the school improvement processes. These publications have been directed primarily to school district personnel and each contains an emphasis on procedural aspects of school improvement.

The assumptions identified herein represent the speculations of one person who has been engaged in the processes of providing technical assistance to selected school districts. By preparing these statements, the intent is to promote the thorough analysis of this state-wide endeavor as the plan begins to impact school districts.

First, the prevailing feature of the official documents of the Pennsylvania Department of Education is that long-range planning IS school improvement. Prominant references are made repeatedly to LRPSI and to the activities which are scheduled to be completed during the first year while the processes of implementation and evaluation are recognized only briefly. While this focus on long-range planning may change as the school improvement process unfolds, the present state of the program justifies the observation that long-range planning rather than some other form of planning is the foundation of school improvement. Consequently, the initial assumption of the school improvement model is as follows:

. Building-level and district-wide school improvements require long-range planning processes.

Other assumptions for each step of the model are as follows:

Step One

Initial Preparation

Assumption: The school district leadership possesses the competence and resources to direct and manage an improvement effort which incorporates a variety of stakeholder groups.

Step Two (a)

Analyze Building/District Programs and Services

Assumptions: The relative importance of program goals should be determined without reference to conceptualizations regarding both the functions of education in a democratic society and to the educational philosophy of the school district.

Information regarding the status of programs and services at the building level is both readily available and in a form which will produce clear references to student need.

Step Two (b)

Analyze District Management Area

Assumption: Improvement processes can be simultaneously directed at the building level for programs and services and at the district level for management concerns.

Step Three

Develop Action Plans for Each Program-and Services and District-Management Priority

Assumption: Those who engage in the preparation of action plans will recognize the need to review information regarding the proposed changes.

Step Four

Implement Building and District Action Plans

Assumption: The various stakeholder groups who participated in the problem identification processes will maintain their commitment to school improvement as action plans are implemented.

Step Five

Evaluate Improvement Activities

Assumption: Evaluation processes will provide the linkage to continued long range planning for school improvement.

Commentary on the School Improvement Model

Perhaps the initial focus on long-range planning in school improvement processes represents an expected development since the first three steps in the model are planning steps. In addition, long-range planning is a mandated process in the Commonwealth and as such, the planning model provides the statutory justification for school improvement. Participation is not voluntary. School districts are expected to adopt the plan and to abide by its procedures. At first glance, long-range planning appears to be synonymous with school improvement.

While each step of the planning model includes several information-organizing processes, each of the five steps involves key role groups and demands specific skills. For example, the first step of preparing the administrative structure involves an administrator with competence to plan and incorporate various parent and community advisory groups. The second step requires evaluation skills in the needs assessment and while no role group is stipulated in the description of the planning model to perform this function, often school districts request technical assistance from some outside agency on this step. Action planning in the third step appears to be a collaborative process involving citizen advisory groups, teachers and others. Planning skills required for the third step vary from problem identification to resource analysis, program design and evaluation. The final two steps of implementation and evaluation are not as detailed as other parts of the planning model.

Implementation of action plans will not only involve many different role groups but these improvement projects will require competencies other than those used to maintain existing conditions. Furthermore, evaluation of project developments will also place new expectations on many persons within the school improvement program.

In all, each component of the school improvement design places additional expectations on key participants. The design tends to emphasize planning processes above other activities which have been recognized as critical to improvement and change. Long-range planning obviously does not necessarily lead to school improvement. Long-range planning probably will not produce changes if the key participants do not possess the competencies to fulfill the functions associated with each phase or step in the model.

Planning models and designs for improvement are abundant in many areas of human endeavor. The Pennsylvania Long Range Plan for School Improvement (LRPSI) emphasizes broad participation, local problem solving and rational planning. To some authorities (Berday and Lauwerys, 1967; Blaug, 1970) a model such as LRPSI represents a social demand approach. The fears of some of the early participants in this state-wide program is that the model will result in more demands on the resources of a school district than can be realistically accommodated. Few of the initial participants view this project as one which will assist them in dealing with the immediate and serious problems of schools. In terms of a knowledge use concept, the skeptics of LRPSI do not consider the knowledge used in this process as relevant.

Technical assistance in LRPSI is presently projected as a support function which is to be utilized when and if the school district sees a need to be served. At first glance, this approach is seldom contested, since school improvement is directed towards school building and school district units. External agencies usually do not have daily operational responsibilities in these school units and therefore, any alternative function other than support of locally-defined problems does not appear to be practical.

Can the support agencies fulfill these expectations in an adequate fashion? It is doubtful. The history of change in education does not include substantial

documentation of success for the external consultants who have been invited into systems with the type of expectations which are defined in this school improvement program.

To restructure the concept of technical assistance from the initial definition would require an alternative forecast of the professional concerns of specialists in higher education, intermediate units and research laboratories. Do persons who are presently relegated to support function, hold a vested interest in the outcomes of school improvement? Perhaps the frame of reference which has been placed around the technical assistance process not only restricts the utilization of that resource but also constrains the potential of improvement in the schools.

The Future of School Improvement in Pennsylvania: A Forecast

It has been claimed by state education department leaders that school improvement is designed to strengthen public support for the schools. This need to modify the decline in public confidence in the educational systems has been advanced by some authorities as a priority of the highest level. But can school improvement as it is advanced presently meet the expectations of those who support the project? What are the likely consequences if the proposed improvements do not materialize?

The prospect of success in this endeavor appears to rest on the competence and commitment of key participants throughout the five-year period. Can administrators who seldom bring citizen and parent groups into active advisory roles plan with these groups as indicated in state guidelines? Can action plans which have been developed by a variety of groups be implemented in schools? Do the school personnel possess the leadership competencies needed in this effort to improve? Will the improvements planned be substantial to the extent that public confidence in the schools will change?

The needed changes may occur within the existing models. Two adjustments in the present conceptualization are advocated:

1. Emphasize model selection over model adoption: School districts are presently provided materials which communicate a mechanistic approach to the problems of improvement. More flexibility in planning, implementation and evaluation is needed. Furthermore, planning and implementation models need to be proposed so districts can select from plans including manpower planning and cost/benefit analysis.

2. Redefine Technical Assistance: Three changes are proposed to replace the present definition.

   A. Technical Assistance as a Stakeholder: Stakeholder groups in school improvement are customarily identified as teachers, citizens, students and administrators. By extending these constituents to include technical assistance representatives and by promoting and contesting knowledge claims of participants, a more substantial commitment to the future of school improvement can be acquired. Furthermore, this modification may improve the collaborative relationships between basic and higher education.

   B. Technical Assistance Required in the Administrative Plan: The early involvement of technical assistance in the processes of defining school improvement foci is proposed because the processes of problem formulation represent one of the most critical steps of the entire plan. How problems are defined is also an important knowledge use phenomena for it entails stakeholder groups making knowledge claims and having them contested by other concerned participants. Consequently, it is herein advocated that Step 1 of the school improvement model be modified to reflect the required involvement of representatives of higher education, intermediate units or state education agencies.

   C. Technical Assistance Functions: While specific functions are not presently delineated, this proposed change could have the impact of focusing the consultative behaviors of those who fulfill the role of technical assistance. Rather than the traditional role of one who is a knowledge expert with a well-defined collection of information to be provided to those who request it, the technical assistance functions should focus on two types of behavior:

      1) Facilitate knowledge transactions among all stakeholder groups in school improvement by advocating the presentation of knowledge claims and urging concerned participants to contest these claims.

      2) Work toward shared perceptions of the areas to be addressed through school improvement.

Many other assumptions could be drawn from the existing materials on school improvement since such statements represent approximations of existing sociopolitical realities. Among these not mentioned in this brief essay are the following:

a. The assumptions associated with prioritizing of goal statements. Does the ranking of goals provide useful information for local problem solving?

b. The assumptions associated with the separation of programs and services from management areas in the needs assessment stage. Does this division further exacerbate the growing schism between teachers and those in management roles in the schools?

c. The assumptions associated with the proposed implementation strategies of action plans. Does the adoption and/or adaptation of proven practices tend to promote local problem solving? Does the practice of maintaining existing practices have the potential of modifying the public's confidence in schools?

d. The assumptions associated with evaluation as the link between improvement efforts and continued long range planning. What conditions will be instituted to improve the practice of utilizing evaluation results in the continuous planning processes?

School improvement of the type needed to restore public confidence in the schools may or may not be facilitated by long range planning. However, one would hardly endorse a helter-skelter approach to this problem. In place of a model, perhaps alternative models of improvement would be more consistent with the understanding that improvement really tends to occur at the building level or even at the classroom level. In all, we may need to recognize that local problem solving is effective to the extent that significant options are available to these stakeholder groups who invest their talents in the processes of school improvement. The challenge may be to project this entire enterprise as an opportunity to learn about the schools and to learn from the processes which are designed to structure the program. To that challenge, knowledge use concepts can contribute.

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KNOWLEDGE IN USE

Considerations in the Sociology of Knowledge Application

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By now there is a considerable literature about the way in which decision makers, professionals, and others use the results of scientific studies and formal expertise. The study of knowledge utilization has become a vigorous field of inquiry as well as of practice. However, what we know does not as yet form a coherent picture and of course it would be premature to speak of a body of theory on knowledge utilization. It is therefore reasonable to reflect on the scope and structure of the conceptual organizing scheme to see how different foci of research on knowledge in use might relate to each other as well as to more general sociological knowledge.

The framework of ideas developed in this article attempts some coherent grouping of concepts and issues. It is undoubtedly incomplete but may serve as a heuristic for (1) exploring relationships among the growing number of concepts and empirical findings and (2) indicating gaps where further research is needed. The article begins with a discussion of the different images of knowledge utilization that have not only guided past research but have resulted in an extensive though unsystematic accumulation of conceptual schemas, concepts, and research findings.

The framework offered as an organizing device begins with the ideas of a knowledge system and under this heading discusses (1) the distribution of knowledge-related activities in social structure; (2) differentiated and diffused knowledge systems; (3) social structure and trust in knowledge; (4) rational

inquiry and rational action; and (5) situs in the knowledge system.

The second section moves from the knowledge system itself to the structure of knowledge and the frames of reference of the participants. Within this section are included knowledge structures; some diffuse knowledge structures; the structure of bodies of knowledge as cultural objects; the distribution of knowledge structures in social organization; the concept, frames of reference; components of reference frames; truth tests and tests of relevance; and decision rules.

The third section includes general processes occurring in knowledge utilization: knowledge maintenance; knowledge transformation; and the construction of problems and the determination of knowledge needs.

The fourth section of the framework encompasses influences on knowledge utilization: the arenas of knowledge utilization and identities and cultural movements.

Some Images of Knowledge Utilization

One of the reasons for the current relative lack of coherence in the field is that both research and practices have been based on different images of the knowledge utilization process. One of these is the notion that knowledge transfers from centers of knowledge to domains of ignorance or knowledge deficits often occur with the initiative taken by those at the center of knowledge. Another image is that people with problems seek out knowledge or knowledge-based products or practices that will resolve their problems and that this involves analyzing needs and identifying appropriate strategies or solutions from available knowledge resources. While these images may be appropriate in many cases, they may lead us to treat the processes involved in a mechanistic manner which masks the complex of social and cognitive exchanges and interpretive work that occurs.

A further complication derives from the fact that for the understanding of one knowledge use process it may be necessary to take into account parallel, competing, or intersecting processes. We also cannot escape from the fact that the utilization of knowledge occurs in political arenas of some kind, and that the processes of interest articulation, of social and political mobilizations, cannot be omitted from inquiry. In fact, the arenas of debate surrounding knowledge utilization are particularly important areas of investigation, since their understanding should shed light on some of the basic issues relating to the social contexts of problem formation and knowledge development. It is in these contexts that social problems are constructed and given legitimation as "problems" to be resolved. The nature of problems--and the question of the social processes that structure them--that overcome thresholds of public awareness and concern seem to require particular attention, including the systematic study of public debates. One aspect of particular concern derives from the fact that knowledge resources in such arenas are unequally distributed. It may be the case that inequality in access to knowledge resources is rapidly becoming one of the major factors in social inequalities generally.

The Idea of the Knowledge System

The Distribution of Knowledge-Related Activities in Social Structure

The understanding of how specific knowledge production and utilization processes hang together may become clearer if we remind outselves of their various larger contexts and devote attention to their detailed and differentiated analysis. Generally, the most encompassing of these contexts is the social knowledge system--that is, that aspect of a social system that emerges into view when one makes a map of the structured distribution of knowledge-related activities, roles, statuses, and resources.

Obviously, one may analyze any social system from a variety of points of

view, each of which will result in a different kind of representation of aspects of its structure. For example, in response to the inquiry into how power is distributed, one may build a conception of a power structure; similarly, the description of economic inequalities yields a picture of a class structure; the focus on networks of communication leads to a certain description, and so on. In analogy we may ask what arrangements exist in a society involved in the production, organization, storage, distribution, and use of knowledge. It is this analytical conception that is meant by the term social knowledge system. Its elaboration allows--indeed, suggests--the asking of further specific questions. For example, one might ask how different sectors of knowledge production activities are related to each other and how they are linked--sometimes through very complex institutional arrangements--to the domains of knowledge use. One might raise questions about the response characteristics of the entire system, or of components of it, to changing historical challenges. For example, how are needs for new knowledge generated, assessed, and in what manner does knowledge production respond to them, if at all? The differential location of groups in relation to the knowledge system, facilitating or hindering their access, the role of gatekeepers and other authorities should become capable of clear presentation.

The fact that the knowledge system of American society is a huge, complex, and certainly not centrally planned entity poses difficulties in comprehension. The idea of an undertaking providing a detailed mapping of the entire structure boggles the mind. However, it is possible to proceed in a macroanalytic vein, establishing the contexts for more specific analyses. Surely, multiple levels of analysis are both possible and necessary in this area--again in analogy to the study of other analytically identified aspects of society.

Differentiated and Diffuse Knowledge Systems

Knowledge systems vary greatly among societies. It hardly needs emphasis

that the emergence of specialized, differentiated institutions for knowledge-related functions is a central phenomenon of modernization, especially accelerated in advanced stages. Within each society there continue to coexist highly differentiated knowledge system components on one side and diffusely structured or undeveloped ones on the other. Their interface is a particularly challenging focus of analysis, since such interface problems are frequently encountered in the practice of promoting technology transfers or the utilization of research.

In a diffusely structured knowledge system the knowledge-related activities and roles are not specifically separated from other activities or role components. In apprenticeship systems, for example, knowledge transfer is embedded in a web of often traditionally defined social relations, without receiving the differentiation and separate attention as in formal training or schooling. The literature on development, institution-building, and modernization contains many valuable insights into these processes and into the need for building linkage structures between differentiated and diffuse systems.

One might well remember that degrees of differentiation and diffuseness and such interface and linkage problems exist within American society. For example, the desire to increase the degree to which a practicing profession relies on scientific research necessarily presses for formal differentiation. This is a process which in turn may trigger very complex alterations in the established relations of control, authority, and power in a professional field. The relatively recent and still continuing growth of science-based medicine may serve as an example. More complex and probably controversial are the various movements of educational reform, aiming to create a formal knowledge base for educational practice.

Social Structure and Trust in Knowledge

We have other interface problems to consider as well. Any knowledge system

must relate in some fashion to the larger social structure of which it is a part, to the divergent material and ideal interests of people, to the distribution of resources and rewards. A critical issue for the study of knowledge utilization emerges in this connection: the question of the social conditions for and the structural distribution of trust in the knowledge system and in knowledge itself.

Social structures, particularly those in the knowledge system, can be seen as frameworks for knowledge. Their legitimacy and perceived trustworthiness undoubtedly have a great deal to do with trust in knowledge itself--even though these two things are not identical. Yet, uncertainty and instability of the social framework is hardly likely to promote knowledge utilization.

Trust is the diffuse, taken-for-granted belief that concern with risks can be properly and reasonably neglected. For example, the risk of deception can be set aside in a trusting relationship. Thus, trust reduces the need for inquiry and information in certain domains, so that it can proceed in others. Trust involves an anticipation of information to the extent that it is not needed: In the stance of trust one assumes that, upon inquiry, one would discover that fears of risk can be reasonably set aside--the assumption being so strongly held that the inquiry itself becomes unnecessary. Trust is thus a prime mechanism for the reduction of complexity and uncertainty. Distrust is expensive because it requires inquiry and control. Where trust is eroded, complex systems of inquiry, control, and regulation emerge, often in attempts to restore trustworthiness. Understanding relations of trust and distrust, especially in the interface domains pointed to above, may well be one of the more practical needs for improving knowledge utilization.

One general mechanism in the production of trust involves the construction of authorized and certified social identities, as, for example, in the professions.

This point is only one example of the grounding of the knowledge system in basic social processes. Processes of knowledge utilization are affected by, and, in turn affect these dynamics of trust and identity. For example, the failure to bridge knowledge gradients, frames of reference and divergent knowledge structures, and divergent interests and identities may result in the rejection of knowledge and in crises of trust.

Rational Inquiry and Rational Action

Rational considerations in designs for action differ from rational considerations in inquiry. In fact, all inquiry is expensive and its pursuit may not be rational given compelling needs to act with limited resources. Inquiry very typically increases complexity and sometimes increases even uncertainty; decisions for action must be attempts to reduce complexity. The fact that the rationales of inquiry and action necessarily differ needs to be taken into account. The idea that knowledge provides a firm basis for action because it reduces uncertainty, while valid under some circumstances, does not always hold true. Many policy makers have become impatient with experts who testify that the situation is complex, and with that on one hand and this on the other something else might be true.

This circumstance relates to the simple fact that modern and post-modern knowledge systems are differentiated and specialized. There is not only a need for knowledge utilization, but also at times a need for protection from too much knowledge--that is, for both the maintenance of a special focus to the exclusion of alternatives, and for the reduction of both uncertainty and complexity which may be the consequences of knowledge surfeits in action situations. The rationality of choosing the right type and amount of knowledge to balance the expensiveness of inquiry against the pressures for timely action and the existing need of protection from knowledge surfeits should be interesting to investigate. It is likely that the informal culture of executives in various institutional domains,

as that of professionals, aids the individual decisionmaker by providing an implicit, possibly unreflected and taken-for-granted calculus regarding both the rationales of inquiry and action and their relation to each other. One would expect a great deal of variation in these cultures and thus quite different modalities of knowledge utilization. The impatience of practitioners with advisers who press research or academic expertise on them may, in fact, not at all be irrational. At the same time, such implicit and undifferentiated rationales, like other forms of implicit theory in practical use, probably can be improved through formal awareness. The error rate in decisions based purely on an intuitive quasi-calculus could conceiveably be improved through the explicit understanding of decision rationales.

Situs in the Knowledge System

Several other such general points should be made about the idea of the knowledge system, but this much must suffice for now. The methodological point should be emphasized, however, that it is useful for any study of knowledge utilization to clarify the situs of the matters investigated in the larger knowledge system. This is meant quite specifically in structural terms: Where, in the large context of institutions of knowledge production, organization, storage, distribution, and use, are the phenomena investigated located? How do they link to adjacent structures? What may be the constraints of the larger system on the specific actors that affect their conduct? What is the degree of differentiation or diffuseness? What are the interface domains?

In itself such attentiveness to context should provide a kind of coherence for the field of knowledge utilization studies: It is the coherence that results from discovering the detailed outlines of, for example, the American knowledge system as a natural entity, and from knowing how special institutional realities make for differences, for instance, in the role of change agents in agriculture

and education respectively. This notion illustrates the coherence of a natural empirical complex under given historical circumstances. There should, however, be a form of coherence of a field of inquiry at a more abstract level, resulting from the concepts and propositions in terms of which research in knowledge utilization becomes organized into a body of knowledge.

Knowledge Structures and Frames of Reference

Thus far we have discussed the social contexts and structures within which individual actors make their choices. We now need to turn to the forms of knowledge itself and the frames of reference of inquiry and decision. It should be quite clear that specifying the social context of knowledge production and use processes is important, but that close attention to knowledge structures themselves is necessary.

Knowledge Structures

There are many types of knowledge. Several typologies have been advanced in the sociology of knowledge--but we do not need to dwell on them; it is not at all certain that any of these typologies is complete and exhaustive. Our primary focus in discussing knowledge in use is on technical and professional working knowledge and on the use of science and science-based expertise, even though we must consider the embedding contexts and competing forms of knowledge. Even in this limited domain we find dramatically different types of knowledge structures. Consider, for example, the differences between science, legal knowledge, knowledge of banking, the pastoral knowledge of a priest, common sense, and "experiential knowledge" just for a start. All of these illustrate types or aspects of working knowledge.

Science is man's most rigorous and successful mode of knowing the world of things. In this sense, scientific knowledge has a privileged status. The knowledge system relying on science has very different consequences for the degree

of control a society has over its environment, and potentially even over itself, than alternative types of knowledge systems. The rational competition of theories within science, which must prove their mettle against empirically established fact, provides for an inherent element of critical capacity which supports a process increasing the adequacy of knowledge. Knowledge adequacy, of course, may well be judged from many different points of view and with widely different demands for precision or scope. However, there can be little doubt that there is a critical difference between science-based knowledge and competing beliefs with regard to adequacy for practical action in the external world.

The important point here is that science-based knowledge systems have a capacity for collective learning, reflectivity, and planful action which cannot be obtained in another way. We will return to this theme of those knowledge systems providing collective learning capacities. Obviously, not all knowledge systems do this--some indeed emphasize so strongly the transmission of established truths that they inhibit collective learning. Further, the existence of scientific research as such is not an adequate condition for a knowledge system providing collective learning capacities for deliberate social action.

In spite of these considerations it is quite clear that science is not now and will never be the only mode of knowledge, even rigorous knowledge. There is not much point in claiming that legal knowledge is scientific in the same sense that astronomy or even sociology is scientific. The same holds for banking knowledge--which includes a vast array of principles of practice, constitutive of the profession of banking. In fact, one may think of banking as a good illustration of the idea of designs for practice around which knowledge may be arranged. These domains differ drastically in the manner in which their knowledge structures are organized, the way in which new knowledge or "knowledge updates" are entered into the structures, in their conceptions of evidence (truth tests), knowledge relevance

and utility, and the relative weight given to descriptive knowledge and theory on one side, and to those of practice or procedure on the other. Knowledge utilization, of course, is, among other things, a process transferring items of knowledge from one domain of the knowledge system into another--that is, from one knowledge structure into another--often requiring transformations. The nature of knowledge structures themselves thus is a subject of supreme interest if one wishes to understand knowledge utilization.

Some Diffuse Knowledge Structures

Mapping the structure of codified and sharply articulated knowledge, as in a mathematical proof or scientific theory, is probably easier than the mapping of diffuse and only in part symbolically defined knowledge structures. Consider, for example, common sense and "experiential knowledge" that are, after all, the embedding contexts of all specialized forms of inquiry. Common sense consists of a taken-for-granted set of assumptions and implicit knowledge structures that define the world of people and things and the routines of everyday life. Clifford Geertz (1975) has analyzed common sense as a cultural system, a dynamic system of socially anchored symbolism whose maintenance and change are contingent upon certain social and practical supports. Similarly, one might investigate a sectarian belief as a cultural system and inquire into the factors affecting its continuance or alteration. Knowing common sense structures and the manner in which they relate to other, more formal knowledge structures may be useful in knowledge utilization. For example, contemporary common sense proceeds in terms of simple, Aristotelian assumptions about the physical world which may well constitute barriers against the comprehension or acceptance of very basic structures in contemporary science. Certain difficulties in teaching college physics may well derive from this fact. Conversely, contemporary common sense contains much folk wisdom about the use of experts and paths to knowledge with probably massive

effects on knowledge utilization patterns.

There is no particular reason to suppose that common sense (ordinary sense) is actually uniform in a whole society. In fact, one would be well advised to suspect the opposite: considerable diversity. For example, what is taken as common sense in one occupation or class or communal subculture may appear strange in another. Discovering the social production of common sense by studying the ordinary practices of everyday life has been the special concern of ethnomethodologists and some contemporary enthnographers. The study of common sense as a cultural system and of the ordinary practices of everyday life is a complex undertaking, precisely because of their not being in any way extraordinary. Common sense cannot be simply thought of as a belief system that one could map easily through interviews, survey questionnaires, or the study of historical documents. Its very nature is that it is not normally thought about by those whose activities flow from it. Further, common sense is shared in often diffusely defined subcultures, and its structure may be unstable. Certainly, maxims and categories of common sense vary over time, history, and situations. However, the patterns of common sense, including expectations of minimal knowledge or skills that a person "ought" to be able to display, may be exceedingly significant contexts or even competitors for the application of formal expertise or knowledge.

Experiential knowledge is another embedding context for the utilization of formal knowledge, in the sense of the tacit understandings and informal skills based on occupational and personal experience which are rarely codified or formalized. However, experiential knowledge in the form of the certitude of the person "who has been there" can become a competitor for formal, analytic knowledge. For example, certain mental health self-help groups cultivate experiential knowledge and are critical of certain aspects of professional knowledge in the professional establishment. At the same time, it would be an error to believe that experiential

knowledge is necessarily opposed to formal modes of knowing, including scientific inquiry. The use of experiential knowledge is often a response to a perceived inadequacy of professional knowledge or formal expertise--and opposition is not so much directed to the formal modes of knowing as to those who have established priorities for knowledge production or specialized formats for its application. However, in the case of some self-help groups experiential knowledge is perceived as a privileged mode of achieving certainty, as, for example, in charismatic or cultist contexts. It should be obvious that when the notion of privileged knowers emerges--that is, persons who on supernatural or preternatural grounds are believed to be capable of unique and blinding insights--then what is taken as privileged experiential knowledge may in fact be in strong conflict with science and professional expertise.

The Structure of Bodies of Knowledge as Cultural Objects

Bodies of knowledge can be transmitted and learned; they are constituted by symbolically represented and structured information. Viewed in this way, they are cultural objects, symbolically formulated and learnable entities. An excellent example of how bodies of knowledge may be differentially structured is found in Hans Zetterberg's book Social Theory and Social Practice (1962). Following a suggestion made by Robert Merton, Zetterberg examined Sir William Osler's principles and practice of medicine which did not organize medical knowledge around basic anatomical or physiological theory, but rather assembled it to satisfy the needs of the situation in which a patient is being examined by the physicain. The point is that the manner in which knowledge is assembled into a body of knowledge is related to some form of its intended use--but the structuring principles or designs for the body of knowledge may vary widely.

We can see what is intended here by inquiring into the mode of coherence of a body of knowledge. For example, the coherence may be provided by certain abstract

but fundamental principles from which more specific statements can be derived. Bodies of knowledge whose coherence rests entirely in such generative principles are, of course, quite different from collections of information for the needs of practice. On one side we have the coherence of a scientific theory; on the other, that of an operating manual. By implication, the boundaries of the domain of each body of knowledge will differ for the two types. Further, there are drastic differences in the manner in which new information can be incorporated into the body of knowledge--as, for example, in the routine updating of an operating manual as against the complex process of modifying a body of theory. The theory-grounded body of knowledge will have, at its best, an elegant rational coherence. The practice-grounded body of knowledge will include a seeming assortment of items of information which it is important for a practitioner to have readily at hand. Here the coherence rests in the design for practical performances.

There are many more such structures than we can now analyze: The domain of a scientific theory on one side and some manual of practice are merely extreme examples. Further, it would be, of course, entirely misleading to think of scientific knowledge as unitary. While disciplinary bodies of knowledge may be thought to have a particular type of coherence, possibly expressed in the notion of paradigms, one must remember the great diversity of forms of scientific knowledge. Empirical generalizations, formal theories, models of limited scope, isolated measurements, and many more modalities of scientifically derived information are important for use. It is probably a good idea to specify in knowledge utilization studies the specific status and structure of the knowledge in question. Some, indeed, might argue that only the very detailed investigation of such highly specific knowledge structures is likely to further the enterprise. However, against this one might weigh the need for taking into account macrolevel knowledge structures as well.

All bodies of knowledge can be thought of as bounded cultural entities, even

though internally differentiated, that are structured in terms of some principle of coherence, and all require some often very particular cognitive skills and orientations for entry. The symbolic structures of bodies of knowledge and the demands of practice and use are apparently interdependent, as is the case in languages. In fact, another way of thinking about bodies of knowledge is in terms of bounded domains of specialized discourse. The investigation of specific knowledge structures and modes of discourse involved in knowledge utilization contexts is needed both for the understanding of transfers and of knowledge transformations.

The Distribution of Knowledge Structures in Social Organization

The fact that bodies of knowledge are differentially anchored in social structure and that therefore access to them is very unequally distributed is obvious. However, the specific relations between the social organization of, for example, professionals and their knowledge is not at all obvious. The sociology of science has made major contributions to our understanding in this area, emphasizing, for example, the importance of organizational arrangements, norms and counternorms, rewards, and incentives (see Merton, 1975). Equally important is the differential distribution of knowledge-related resources, skills, and jurisdictions. All this no doubt affects the role of knowledge-related incentives and interests.

The problems of this area are of importance in the deliberate design of research, development, and implementation systems--the planning of optimally effective organizational forms for knowledge production and use. Michael Radnor and his colleagues have done much to illuminate such systems, including comparisons across fields of different technological maturity.

The significance of this inevitable social structural differentiation for social inequality has already been mentioned. There are massive forces at work here, not readily modified, which must be considered in any major policy addressing the issue of a general reduction of societal inequality.

The Concept, Frame of Reference

Just about everyone is familiar with the fact that a single event may receive very different interpretations for a medical, legal, sociological, or other point of view. There are manifold ways in which special frames of reference are signalled in our society. When lawyers say in conversation, "Well, from a strictly legal point of view..." they mean to signal that a specific mode of constructing reality is about to be used, and they also acknowledge that competing modes are available. We are familiar with such professional frames of reference and certain aspects of their variation, including idiosyncratic ones.

Frames of reference are the underlying structures of cognitive assumptions, dispositions toward certain decision rules in inquiry, and expectations which form the proximate contexts in which inquiry proceeds. They are closely related to the inquirer's cognitive skills that may be required to be successful in using the frame of reference and to culturally defined knowledge structures, but they are not identical with them. Thus, frames of reference are rarely the object of knowledge; rather, they are the often unreflected basis for structuring an inquiry. There are, of course, strong individual variations, but role-embedded frames are of particular sociological significance. Such frames may be highly standardized or codified, as in specialized professions, or they may be diffuse. We can describe a set of components for frames of reference, but should remain mindful of their systemic, interdependent character. To emphasize the point again: The frame of reference of an inquirer is not identical with the knowledge produced or accessed in terms of it. The frame of reference, instead, is akin to the lens through which an observer looks; the resulting knowledge is what the observer sees.

In differentiated knowledge systems we find a great diversity of frames of reference as well as of knowledge structures. Knowledge transfers and transformations technically require interrelations among divergent frames of reference

as well as of knowledge structures. Knowledge transfers and transformations technically require interrelations among divergent frames of reference and translations. In this connection the problem of relativism often arises as the belief that knowledge can only be assessed within a given frame of reference and has its validity only relative to it. This, however, is not so. Knowledge of all forms as well as frames of reference can be subject to rational critique. In its own way, each frame may be considered as a special and limited formation of rationality--with effort, frames of reference can become mutually comprehensible. Further, given the frame of reference, there exist strong constraints to attend to particular aspects of experience and reality, but it is reality, nevertheless.

We are not about to propose a comprehensive typology of frames of reference; much more naturalistic, detailed descriptions are needed for this task to be feasable. The dimensions of variation of frames of reference and of knowledge structures are the major dimensions of knowledge in use.

Components of Reference Frames

In listing the components of frames of reference which it appears necessary to distinguish, one might begin with the epistemological and methodological assumptions about the conditions of gaining valid information and proceeding in inquiry. There need to be schemas or sets of categories for ordering information. Master models or paradigmatic conceptions provide a mode of coherence for the domain of inquiry, often embodied in exemplars. At some point the progress of inquiry is checked by reality or truth tests and by tests of relevance. Truth tests are decision points concerning evidence; the grounds for accepting or rejecting truth claims include the obvious empirical as well as formal rational tests. Pragmatic tests rest on proof or workability. But there are other tests of varying stringency and reliance on trust or authority. Checking an item of knowledge for consistency with what is already known may be a truth test as well as reliance on the credibility

of the source. We will discuss this complex matter separately. Tests of relevance are decision situations in which the potential significance of an item or line of inquiry is assessed with regard to the inquirer's cognitive interests. The question here is what remains outside the inquiry.

Frames of reference tend to set such boundaries around what is considered to be relevant, limiting domains. The manner in which the frame of reference is bounded influences its potential linkage to other frames. For example, there may be notions of legitimate overlap or potential complementarity in different points of view, or there may be strong forces to defend the monopoly of one frame of reference for a claimed domain. Jurisdictional disputes are frequent occurrences, as are frames with boundaries drawn so tightly that it is difficult to transcend them. The question of how to arrange realistic cooperation among inquirers of different frames of reference within universities, for example, has given rise to the large literature on interdisciplinarity, multidisciplinarity, and related topics.

It is in these areas that we are likely to find strong forces facilitating or blocking knowledge flow. It should not be overlooked that frames of reference are linked to skills as well as identities; that is, they are anchored in strong emotional investments of the individual knower as well as of the relevant community. In the case of professionals, the frame of reference is an especially vital component of one's personal and public identity. It should not be surprising, then, that it is not modified or abandoned lightly. These factors may limit as well as enhance a person's specialized learning capacity, but they are particularly important in the consideration of collective problem-solving and knowledge utilization.

The degree to which frames of reference are articulated and codified--that is, formalized and standardized--is one of the major dimensions of variation

among them. Diffusely structured and noncodified frames can be socially controlled and transmitted in terms very different from those obtaining for codified and specified frames. Obviously, the scope for experiential knowledge is much greater in the former, public transparency potentially greater in the latter.

Truth Tests and Tests of Relevance

The variations in truth tests and tests of relevance, while they are aspects of reference frames, require our special attention because of their particular importance. There is an enormous variety of truth tests, but it may be useful to distinguish between two main types: those that increase the need for information in order to be accomplished and those that reduce it. Empirical, scientific truth tests are of the former variety. To subject an assertion to an independent empirical assessment requires a very substantial effort at inquiry and the generation of possibly a very great deal of information. This is also true of the independent performance of a rational truth test, as in the recalculation of a mathematical proof or theory. By contrast, the assessment of truth claims through referral to consistency with what is already known, credibility of source, authority, or tradition, reduces the effort of inquiry and minimizes the need for new information. The rationality of inquiry itself favors complex truth tests, the rationality of decision for action may favor simple and economical ones. Clearly, the rationales of truth test selection of persons responsible for action within constrained time frames and persons responsible for systematic inquiry are likely to differ--but not necessarily on extrarational grounds. The costs of inquiry, even though not necessarily monetary, must be weighed against the costs of inaction or untimely action. The systematic effort to investigate the range of truth tests in use in a variety of institutional settings still needs to be undertaken. John Marx formulated a tentative typology of such tests based on the intersection of three dimensions:

> First, time and information saving (non-learning) versus time and information spending (learning); second, emphasizing technique and performance versus emphasizing knowledge and cognition; and third, evaluation of the knowledge or reality source ("Who says so?") versus evaluation of the consequences or effects of the knowledge ("What happened?" "Did it work?"). (Holzner and Marx, 1979)

The work of Carol Weiss and Michael Bucuvalas (1978) needs to be specifically mentioned in this context. They investigated the frames of reference of decision makers in mental health fields in terms of which these executives assess the usefulness of social science research for their work. (Weiss and Bucuvalas also deal with this matter in their forthcoming book Social Science Research and Decision Making to be published by Columbia University Press.) They found these decision makers employ both truth and utility tests (the latter are what we call relevance). In judging truth claims apparently the tests rest either on congruence with existing knowledge acquired in past experience or on the scientific merit of the study. Relevance is also assessed on one of two possible grounds: Utility is judged to be high if a study has more or less direct implications for practical action, or if it contradicts the assumptions of current policy. The fact of research quality was considered particularly important in those cases in which a study might become subject to challenge and controversy. It appears that the judgment of the scientific merit of the study is closer to the information-intensive type of test, while congruence is closer to the information-saving side. Weiss and Bucuvalas' study of the decision-making processes shows the extent to which formal truth tests are embedded in experiential knowledge--a point relevant to our brief discussion of experiential knowledge above.

The criteria by which people make judgments as to what is relevant to their work or inquiry probably are even more difficult to submit to systematic inquiry than truth tests. Surely, decision makers consider work relevant that shows them

implications for their programs for actions. Inquirers would consider information relevant that assists in a program of inquiry. But questions remain about the exact manner in which some information comes to the attention of a person and how it is sifted. Yet, the notion of relevance tests is a significant one in spite of its slippery nature. It does appear evident that professions, for example, spend considerable effort in structuring the information environment of their members so that relevant data, methods, or other knowledge components become available. Of course, there may be bitter and acrimonious disputes over whether this is successfully done. The notion of frame-of-reference-based jurisdictions over knowledge domains no doubt has much to do with relevance tests. For the student of knowledge utilization the question of relevance tests might well become intriguing when the issue is raised why certain knowledge is judged irrelevant, useless, and rejected--sometimes when an outside observer might assume it to be a matter of possibly even crucial importance.

Decision Rules

In both truth and relevance tests there operate implicit or explicit decision rules. One may contrast the decision rules given to a jury in a court of law in a criminal case (the accused is presumed innocent until proven guilty), with the decision rules of a medical examiner (let's err on the side of caution). These examples illustrate decision rules demanding a different allocation of the burden of proof in relation to the taking of action. The medical decision rule can easily be interpreted as an activist one; relatively little proof is required for at least some therapeutic intervention to be justifiable. In the case of criminal law very considerable proof is necessary before a person may be found guilty. The conflict of such decision rules among different professions is becoming particularly evident in discussions relating to the policy of obtaining the informed consent of a mental patient to a program of treatment. Both legal and medical professionals operate

under different frames of reference and decision rules in such cases. Or one might think of the very likely different amount of evidence a classroom teacher and an experimental researcher respectively might require in order to decide that a psychological experiment would not disrupt or harm instruction.

General Processes Occurring in Knowledge Utilization

Knowledge Maintenance

It may be best to think of both the social organization of knowledge-oriented activity and the formal structure of bodies of knowledge in terms of a cultural system. This point of view raises the question of knowledge maintenance or change. Science-based or science-related bodies of knowledge necessarily must be adapted to the emergence of new knowledge. Complete ossification of bodies of knowledge, however, has at times occurred, usually through ritualization or sanctification. More typical today, however, is the situation of a pattern of knowledge growth which requires of organizations and individuals an effort to "keep up." The way in which such knowledge maintenance occurs is very likely to be influenced profoundly by the nature of the frame of reference, tests of truth and relevance, and the decision rules in inquiry. We therefore should expect to find a wide variety of knowledge maintenance styles. It is interesting that such knowledge maintenance is not always thought of as explicit knowledge utilization. Much of the research into knowledge utilization seems to proceed on the assumption that policy makers and practitioners subscribe to the same knowledge maintenance pattern that is prescribed for scholars--namely, the careful tagging of each item of information to a named source.

Again, we need to turn to Carol Weiss' work. She reports that decision makers are often unaware of the sources of their ideas.

> He keeps up with the literature, or is briefed by aides, or reads state of the arts reviews of research in intellectual magazines, or reads social science stories in the New York Times, Washington Post, or Wall Street Journal. All the

> information bits seep into his mind, uncatalogued, without citation. He finds it very difficult to retrieve references to any single bit of knowledge. (Weiss, 1976)

This quote describes a particular form of knowledge maintenance. Scholars are expected to follow a different model--being exposed to incentives to be citation-conscious. Surely, the fact that policy makers find it difficult to give an account of their knowledge sources does not mean that the process is unstructured.

It appears that a great deal of effective knowledge utilization occurs in the context of normal knowledge maintenance efforts. In designing knowledge use systems one might keep this in mind and investigate not only the nature of the knowledge structures to be used, but also the institutionally prevailing knowledge maintenance activities. We know already, for example, that such patterns are quite different among research scientists and among engineers.

Knowledge Transformations

Throughout this article we have emphasized the strongly interactive nature of the relationship between knowledge and social arrangements, not, of course, in the sense that the validity of knowledge is in any way determined by or reduced to social configurations, but in the sense that the uses made of knowledge tend to shape its structure, tend to influence knowledge priorities and relate it to a variety of embedding contexts. Early in our discussion we drew attention to the fact that in the flow of knowledge through a social system knowledge transformations occur. This appears to be a particularly important circumstance which is certainly insufficiently understood even though it is of the utmost practical significance. For example, knowledge transformations are involved in the making of summaries or abstracts. It is obviously not merely the case that in the summary some information contained in the original is left out, but a different arrangement becomes necessary, highlighting some items and not others. The summary is an illustration of a knowledge transformation involving complexity reductions: only

the "essential" features are included. Just what emerges as "essential" is undoubtedly strongly influenced by the purposes and objectives of the individual actors involved, but it is also related, no doubt, to the structure of frames of reference, established priorities for action, and criteria of truth and relevance. Knowledge transformations also occur in the opposite direction, leading to increases in complexity. One prototypical situation illustrating this point is the transformation of a seemingly simple practical question into a question for social science research. Almost always complexity must necessarily be increased in this process.

Yet, the considerations of complexity and simplicity relate to only one dimension of possible knowledge transformations. One may wish to consider the subtle transformations that occur in translating a statement from the context of one language community into that of another. The translation of works from English into German or Russian are drastic examples in which it occurs with some frequency that exact equivalents of terms cannot be found and subtle shifts of meaning through connotations, differences in the established usage of phrases, and the like appear. Something similar should be expected to occur in translations from one practice-oriented language community within the same culture into the context of another. The concept of frame of reference again should be useful in this regard. As knowledge is transposed from one frame of reference domain into that of another, it is not merely translated into different language conventions, but also subjected to different considerations of priority, preferences for structuring, and principles for assessing its relevance and truth. Most significant for the understanding of knowledge application would be a thorough grasp of what knowledge transformations occur in the process of fashioning principles of professional practice from theory-based scientific insights. Bodies of professional practice have a different structure and composition than scientific theories. This

much, of course, is obvious. Yet, it seems to us that the nature of the transformation itself is insufficiently understood.

Research proceeds of necessity analytically and generates often highly specific information. The synthesis of such information into more coherent and abstract, hence more readily transposable, bodies of knowledge clearly is a strategically important process in knowledge systems. How does knowledge synthesis proceed? One answer is simply that it is a creative process, requiring new insight and superior ability on the part of the synthesizer. Surely, knowledge synthesis is different from the writing of summaries or abstracts. Yet, there are patterns and principles in synthesizing knowledge which should be examined systematically. It is unlikely that only one form or pattern of synthesis will emerge as the dominant one; we would suspect that modes of knowledge synthesis would be strongly related to the structure of extant bodies of knowledge and the relevant frames of reference.

Finally, there are certain effects of new knowledge on the nature of issues and ethical considerations which, while they in themselves can hardly be called knowledge transformations, still may have a profound impact on the forming of new problems and ethical dilemmas.

The Construction of Problems and the Determination of Knowledge Needs

In established knowledge production and use systems many problems receive routine definition and solution. For example, what may be an excruciating problem for a client or patient may be simply "all in a day's work" for a professional. Normative frameworks of policy and the cognitive and other resources available may be entirely sufficient for the routinization of problem definitions and action. What was said above about knowledge maintenance is relevant here, too. Such a state of affairs of routinization in the use of knowledge patterns, however, may not at all be ideal from the point of view of assessing the effectiveness of

organizational or collective learning capacities. Many establishments went merrily toward disaster, dealing with routine problems, excluding from their purview much more fundamental problems that went unrecognized. One might see here an organizational similarity to Thomas S. Kuhn's distinction between normal and revolutionary science. (Kuhn, 1970)

The way in which problems are recognized, defined, redefined--or ignored--is not at all a simple matter. (For a novel view of science relating to these points, see Larry Laudan, 1977.) For a problem to arise there must be somewhere for someone at least a minor break in routine, a puzzle, the recognition of potential opportunities or disasters. We are speaking here of situations in which there is a reason for a deliberate search for knowledge resources or deliberate decision. The problem may be thought solvable by referral to someone's knowledge, or it may call for new knowledge production. Problem definitions are often obviously related to frames of reference and the jurisdiction of professions or research disciplines.

For example, one might think of the battle over the proper view of alcoholism as a problem: Is alcoholism primarily a matter for physicians and health institutions, or a matter for the police and the courts? For another example: What is the proper definition of the problem faced by U.S. schools in educating children of groups speaking some language other than English? Is the issue to be defined as requiring the provision of linguistic resources? Is it primarily a problem of basic language policy?

It may be useful to think of the distinction between broad types of truth tests as having relevance for the formation of problems as well, since problem formations tend to suggest the direction for the possible solutions. One type of problem appears to call for extensive information search and inquiry. This may well be quite different from the kind of problem formation that seems to call for

complexity reduction through decision and action.

As even these simple examples show, problems tend to be defined in arenas of contending groups--but the distribution of control over and access to cognitive resources in these groups matters very much. Affixing a particular definition to a problem is, of course, a matter of consequence; often problem definitions point the way toward some solution, and exclude others. Further, the nature of the problem definition may enhance the relevance of particular frames of reference, knowledge skills, and bodies of knowledge. It is well known that research organizations tend to structure problem definitions in such a way that their resources can credibly be brought into play.

Problem definitions also enter into what we touched upon in the discussion of tests of relevance: they delimit what knowledge is thought to be relevant--that is, they define knowledge needs. In a complex knowledge system, however, one needs to be aware of the fact that the structure of problems, and hence knowledge needs, is transformed in the different domains of the system. A practical problem needs to be translated into a research problem, for example--its nature changes in the process.

Similarly, there is the matter of which problem exists for whom. The complex arena of participants in contentious debates, the complex nesting of organizations and groups provides ample room for misunderstanding. For example, evaluation research may be addressed to one set of problems defined by a government agency, but for a particular organization it may simply create the entirely different problem of the organization's survival.

Influences on Knowledge Utilization

The Arenas of Knowledge Utilization

Knowledge utilization always involves someone's ideal or material interests. There are always some considerations of power relations, or organizational interests

in survival, maintenance of staff and growth involved, to mention only a few. In addition there are vocational and professional interests in control over jobs and situations, and problem definitions, quite aside from the often major political interests of public forces, such as political parties, labor unions, ethnic groups, and the like.

This point links the study of knowledge utilization with the analysis of political processes generally. This broadening of the analytic perspective is hard to avoid, however. The structure of the arena and the nature of the knowledge-relevant incentives for contending groups may yield important clues for understanding the dynamics of knowledge utilization. The actual nature of incentives affecting utilization may be at cross purposes with the intentions of policy. For example, it appears that the incentive structures surrounding relevant decisions actually contribute to hospitals acquiring ever more costly technology for individual patient care. Or it might be the case that certain educational testing programs are used more for organizational legitimation than for practical student diagnostics. It also may be true that school districts may see incentives to use federal assistance programs for the additional revenue they provide, rather than as genuine aid in the institutionalization of innovation.

While basic work on the understanding of frames of reference, knowledge structure, and fundamental principles of knowledge systems is needed, in this area it becomes apparent that knowledge utilization programs need to link with the detailed understanding of historically specific, perhaps even idiosyncratic and unique circumstances.

Identities and Cultural Movements

We have already mentioned the fact that frames of reference are components of both personal and sometimes collective identities, but so are the interests we have discussed. The evaluation of knowledge in the broadest sense and the formation

of trust or distrust in bodies of knowledge are tied to those complex sociocultural dynamics of identity formation, maintenance, and change. Contemporary, cultural, and political movements have become particularly significant in this regard--one may think of the thematic of recent cultural movements and the reconstruction of meanings they have brought about: the civil rights movement, the women's movement, the rise of consumerism, the environmentalist movement, and others. Each of these also promulgates models of identity and agenda of what it is necessary to know. The field of knowledge utilization studies has been strongly influenced by the knowledge demands generated by such efforts as social innovation and reform. Certainly, at least in the social and behavioral sciences, knowledge priorities and patterns of knowledge utilization--indeed, to some extent the social distribution of knowledge resources--have been affected by these movements. A narrowly technological view of the knowledge utilization process may well be misleading, unless these broader cultural dynamics are taken into account.

Knowledge Utilization, Trust in Knowledge, and Organizational Learning Capacities

A great deal of theoretical work will be necessary for the adequate understanding of knowledge utilization in addition to the intensive empirical research and ethnographic description now underway. We have in this overview only touched upon major themes that seem to require attention and thought and have suggested some potential modes of coherence. Knowledge structures and bodies of knowledge are not only repositories of information. One can work with them only in certain ways because their cultural and technical structure as well as their base in social organization impose constraints. The nature of frames of reference and their dynamics and decision rules may channel or limit both cognitive and practical efforts. The knowledge transformations occurring between different frames and organizational contexts need to be understood. We expanded the scope of analysis to include arenas of knowledge utilization, contests about the definitions of problems, and the

distribution of incentives and interests, as well as the profound effects of cultural movements.

Does this collection of ideas improve the conceptual coherence for the sociology of knowledge application? Not very much as of yet. However, there is a crucial goal to be pursued by applied research on knowledge utilization, which is at the same time a basic theoretical goal and historical objective increasing society's capacity for self-direction. It is the understanding and improvement of collective, organizational, and, indeed, societal learning capacities. In the beginning of this article the importance of science, because of its critical capacity, was especially emphasized. After all, much of the current effort in the study of knowledge utilization is not limited to a naturalistic investigation into what knowledge is used by whom and how. It is also a component of an effort at development, aiming to increase the reliance on research and science, and the critical capacity for making intelligent choices. The societal knowledge system, after all, does present a kind of collective learning capacity. Work toward understanding the nature of organizational learning capacities, both in the naturalistic descriptive and in the normative modes, might lead to the necessary theoretical clarity as well as coherence for the field. It is from this point of view that the emphases presented in this article were selected.

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